NAVAL WAR COLLEGE
Newport, RI

Moving Targets and Joint Theater Missile Defense Doctrine: Does It Apply to Locating and Engaging the Needle in the Haystack?

by

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Seminar 4

A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Maritime Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

SIGNED: _____

DATE: 5 Feb 99

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Security Classification This Page

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED	
2. Security Classification Authority:	
3. Declassification/Downgrading Schedule:	
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.	
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT	
6. Office Symbol: C	7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207
8. Title (Include Security Classification): Moving Targets and Joint Missile Defense Doctrine: Does It Apply to Locating and Engaging the Needle in the Haystack? (U)	
9. Personal Authors: MAJ Robert T. Thompson, Jr., USAF	
10.Type of Report: FINAL	11. Date of Report: 5 Feb 1999
12.Page Count: 26	
13.Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.	
14. Ten key words that relate to your paper: Joint Missile Defense Doctrine; Moving Targets; Mobility; Engagement; Information Technologies; Crisis Action; Deliberate Planning	

15.Abstract:

Moving targets are those characterized by substantial mobility. Due to this mobility, targeting information is transient in nature lasting only hours or even minutes. This makes moving targets hard to engage. In the recent past, by the time the target was acquired, identified and targeted, it had relocated making engagement unproductive. Information technologies (network-centric and sensor-to-shooter concepts) are making this sequence of actions faster and making it viable now to target these time-critical, moving targets.

16.Distribution / Availability of Abstract:	Unclassified X	Same As Rpt	DTIC Users
17.Abstract Security Classification: UNCLASSIFIED			
18.Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19.Telephone: 841-6461		20.Office Symbol: C	

Those who are possessed of a definitive body of doctrine and of deeply rooted convictions upon it will be in a much better position to deal with the shifts and surprises of daily affairs than those who are merely taking short views, and indulging their natural impulses as they are evoked by what they read from day to day.

Winston Churchill

EXECUTIVE SUMMARY

Moving targets are those characterized by substantial mobility. Due to this mobility, targeting information is transient in nature lasting only hours or even minutes. This makes moving targets hard to engage. In the recent past, by the time the target was acquired, identified and targeted, it had relocated making engagement unproductive. Information technologies (network-centric and sensor-to-shooter concepts) are making this sequence of actions faster and making it viable now to target these time-critical, moving targets.

The capability to attack moving targets is only part of the solution for the Joint Force Commander. He also needs doctrine around with which to plan, equip, train and employ his forces. Because of the recency of the technological innovations, little is published on this target set in general; however, there is doctrine for a specific type of moving target-theater ballistic missiles.

Joint Pub 3-01.5, *Doctrine for Joint Theater Ballistic Missile Defense (JTMD)*, was written to capture the lessons learned during the Gulf War about the Iraqi Scud missile threat. It is invaluable doctrine for what is surely an ongoing threat, but it is narrow in focus.

JTMD doctrine is applicable to the more general moving target set and can serve as a boiler plate for a new doctrinal publication. Codifying actions in doctrine allows the Commander in Chief/Joint Force Commander to establish clear lines of responsibility and command and control along which component commanders can respond to the new threat. Most importantly, it provides a focus to operations so that moving targets can be adequately addressed for both crisis action and deliberate planning.

INTRODUCTION

In *War and Anti-War,* Alvin and Heidi Toffler present their ideas on the information revolution underway. Specifically, they present the case that whomever controls the information arena in future conflicts will have the advantage, since they will control what is known about what by whom. The Toffler's also contend that information is driving the next revolution in civilization. Information may become, they predict, the cause of future conflicts and have significant influence over how they are fought.[1] The reality of their predictions is evident today. Information technologies are creating viable command and control structures that were not viable only years ago.[2]

It is our ability to see and know to the exclusion of an enemy's capability to do the same that defines information superiority and the concept of Information Warfare[3]. The potential for such superiority is the redefinition of the way war is fought as the Tofflers suggest. One of the significant lessons future enemies can take from the Gulf War is not to fight the United States on terms favorable for

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[1] Alvin Toffler and Heidi Toffler, War and Anti-War (Boston: Little, Brown and Company, 1993), 163.
[2] Gordon M. Wells, "Deep Operations, Command and Control, and Joint Doctrine: Time for a Change?," Joint Force Quarterly 14 (Winter 1996-1997): 102.
[3] Joint Chiefs of Staff, Joint Doctrine for Command and Control Warfare (C2W) (Joint Pub 3-13.1) (Washington, D.C.: 7 February 1996), I-3.

conventional battle. Asymmetric warfare may well be the preferred, if not the only feasible method of attacking the United States.[4] As presented in Joint Pub 1:

> *Joint operations should also shield the joint force against enemy asymmetric action. Protective action and posture, usually including joint offensive action, should be taken to defend our forces from potentially effective asymmetric attack. Antiterrorism is one example of friendly force protection. In another instance, to counter the Iraqi tactical ballistic missile threat during Operation DESERT STORM, the combination of space-based warning, antitactical missile defenses, friendly force protective measures, and active efforts to destroy SCUD launchers provided a full-dimensional joint shield.*[5]

The asymmetric threat is out there and recognized by doctrine. Moving targets may be the manifestation of this asymmetric effort on the battlefield.[6] Force XXI, the Army concept of future battle operations already challenges commanders to develop expertise to counter future asymmetric threats.[7] Joint Doctrine should address this potential reality to better prepare the US military for what is a significant threat.

THESIS STATEMENT

In 1991, General Short, USAF Air Combat Command Deputy Director for Operations, identified four factors impacting American ability to strike Iraqi Scud missile launchers, of

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[4] For amplification on this topic see Thomas B. Mahnken, "America's Next War," The Washington Quarterly, Summer 1993, 171-184.

[5] Joint Chiefs of Staff, Joint Warfare of the Armed Forces of the United States (Joint Pub 1) (Washington, D.C.: 10 January 1995), IV-11.

[6] There is no accepted definition in doctrinal publications for moving targets. Operators across the spectrum offer many examples, but agree only on the time-critical nature of engaging such targets. This is based on my own experience, 1500 hours flight time in B-1Bs, and 5 years instructor time. Other opinions informally obtained included an F-16 instructor pilot, U-2 instructor pilot, F-15 Fighter Weapons School Instructor Pilot, and a U.S. Navy Surface Warfare Officer with experience in naval gunfire support.

which response outside of weapon station time was one.[8] Targets capable of moving are of increasing threat to theater Commander in Chiefs (CINCs) as evidenced by their inclusion in the suggested topic listing for the Joint Military Operations Department at the U.S. Naval War College. Moreover, moving targets are not currently addressed by Joint Doctrine. I contend theater missiles are only a subset of the greater moving target set, and that Joint Pub 3-01.5, *Doctrine for Joint Theater Missile Defense* (JTMD) is applicable in large part to moving targets. JTMD doctrine operational scheme and command and control structure should be directly exportable as a basis to create moving target doctrine.

FRAMEWORK

Before an in-depth analysis of Joint Pub 3-01.5 is undertaken, some foundations must be put in place as a frame of reference for this paper. Foremost is an accepted definition of doctrine. Joint Pub 1, *Joint Warfare of the Armed Forces of the United States*, provides this definition:

> *Military doctrine presents fundamental principles that guide the employment of forces. It provides the distilled insights and wisdom gained from our collective experience with warfare. However, doctrine cannot replace clear thinking or alter a commander's obligation to determine the proper course of action under the circumstances prevailing at the time of decision. Though neither policy*

[7] Randall L. Rigby, "Report Out: 1996 Senior Fire Support Conference--Focusing Fires for Force XXI," Field Artillery, May-Jun 1996, 20.
[8] Mark Hewish and J. K. Wilson, "Closing the Loop: New Technologies to Counter Mobile Targets," International Defense Review 28 (March 1995): 69.

nor strategy, joint doctrine deals with the fundamental issue of how best to employ the national military power to achieve strategic ends.[9]

Doctrine is part of the rigorous training and education that occurs during peacetime when thought can be focused without the constant stress of combat. As yet, formal research on the moving target set is not abundantly in publication; this is the catalyst for this work.

To begin the thinking on moving targets, a definition is in order. As already stated, a definitive statement on this target set does not exist. My working definition is the result of numerous conversations with operators (shooters) on what the term means. The constant threads in my conversations have been the factor of time, the time constraints involved in engaging these targets, and the implied mobility. The moving target definition I use is '*a target characterized by substantial mobility. Due to the transient nature of target location, they are very difficult to engage.*'[10] Moving targets can be mobile ballistic missiles, SOF forces, temporary staging areas, or other transient targets. Moving targets are not tactical surface to air missiles or large ground force movements: these targets sets are addressed by other doctrine.

For the purpose of presenting learning points by example, throughout this paper my convention is to use Blue

[9] Joint Chiefs of Staff, Joint Pub 1, I-3.
[10] see footnote 6

force to refer to U.S. forces and Red force to refer to enemy forces.

Factors of space, time, and force define the Blue environment.[11] The interaction of these three impact the who, what, when, where and how of Blue action. Given the transient nature and high mobility of moving targets, factor time is critical for Blue forces. To get forces to the target within the time constraint may be impossible due to factor space considerations. Given the 48 to 72 hour response time for the air tasking order, planned responses by air may be wasted effort. Also, depending on the range from weapons to the target, land and maritime forces may be ineffective. During the Gulf War, only three hours were required for coordination between the land component commander (LCC) and the air component commander (ACC), yet this delay cost the LCC seven of fourteen time-critical targets.[12] The different areas of operation (AOs) may also complicate response by dictating which force is used. What are the implications for doctrine? It will be impossible to define up front all the space, time, and force considerations for moving targets. Instead, responsibilities and command relationships should be addressed by doctrine in conjunction

[11] For an in depth review of these topics see Milan Vego, "On Operational Art" [third draft], unpublished manuscript, Naval War College, September 1998, 21; ibid., 57; ibid., 73.

[12] David H. Zook, "The Fire Support Coordination Line: Is it Time to Reconsider Our Doctrine?" (U.S. Army Command and General Staff College, 1992), 139 cited in Martin L. Vozzo and others, "Who Should Coordinate Fires in the Battle Interdiction Area?," Field Artillery, Sep-Oct 1995, 40.

with planning and operations. This does not directly correlate to Red force considerations.

Red force considerations for space, force, and time are similar in context to the Blue force considerations; however, care must be taken not to mirror image Blue actions onto Red forces. I contend an asymmetric threat is the most likely enemy course of action. My purpose is not to define all possible options available to Red commanders, but to distill the most important points to incorporate into Blue doctrine. The synthesis of these points is to expect the moving target threat to present itself at night, in the weather, far removed from the forward edge of the battle area. This combination presents the Blue commander with the most difficult problem to solve. If Red force actions ignore any of these factors, the solution is easier for the Blue commander.

Blue commanders are not working totally in the dark though. Technology is quickly providing tools to facilitate the Blue solution. Sensor technology is making the intelligence preparation of the battlespace more complete providing the Blue commander with situational awareness. The combination of Network-centric warfare and Sensor-to-Shooter advances are making it possible to compress the timeline from

acquisition to engagement.[13] This is not without cost. The reality of these advances is the outpacing of doctrine and the threat of overwhelming decision makers with information.[14] This is another justification for establishing doctrine for moving targets and removing some of the fog from around this target set.

With this foundation work in place, it is now appropriate to lay out how the research will proceed.

METHODOLOGY

Joint Pub 3-01.5, *Doctrine for Joint Theater Missile Defense*, will be stepped through systematically and analyzed for evidence supporting this thesis. At the same time, important doctrinal considerations for moving targets will be developed. Where possible, applicable points will be supported with excerpts from the publication and a discussion of their applicability. The intent is not to cite the entire joint publication. Instead, my thesis will be supported using significant evidence from the publication.

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[13] Arthur K. Cebrowski and John J. Garstka, "Network-Centric Warfare--Its Origins and Future," U.S. Naval Institute Proceedings 124 (January 1998): 29; Randall G. Bowdish, "A Theater-Level Integrated Sensor-to-Shooter Capability and Its Operational Implications," unpublished manuscript, Naval War College, 8 March 1995, 4.

[14] Bowdish, "Sensor-to-Shooter," 10.

ANALYSIS

The German V-2 rocket was a significant terror weapon used against the British islands during World War II.[15] Though inaccurate, the rockets made up for their aiming inaccuracies in the effects they had on the British population. Today a threat similar to the V-2 is found in the Iraqi Scud. Though impossible to determine the exact employment doctrine, it is apparent Iraqi Scuds were used similar to the V-2, as terror weapons with the hopes of fracturing the Coalition. The President of the United States ordered unprecedented steps to counter this threat.[16] After the war, doctrine was developed to catalogue this new capability -- Joint Pub 3-01.5, *Doctrine for Joint Theater Missile Defense*. However, JTMD doctrine has applications concerning responsibility, command relationships, and command and control beyond its current narrow focus of theater missiles. This is especially true in light of the current moving target discussion.

Responsibilities and Command Relationships:

Responsibilities and command relationships are critical to any military endeavor. Before moving targets are engaged, the command structure must be clear and the responsibilities of all the key players must be universally understood. For

[15] For an expanded discussion on the V-2 rocket and its effects, see George D. Kennedy, Vengeance Weapon 2 (Washington, D.C.: Smithsonian Institution Press, 1983).

the majority of doctrine published, command and control is not adequately addressed.[17] Chapter II of Joint Pub 3-01.5 lays this out for the Joint Force Commander succinctly. In summary:

> *The joint force commander (JFC) establishes guidance and objectives for JTMD. This guidance should be reflected in appropriate operation plans and their annexes. The JFC must define and implement a methodology for joint TMD activities. The JFC's concept of operations specifies the objectives to be met and provides guidance for the employment of command, control, communications, computers, and intelligence (C4I), attack operations, active defense, and passive defense measures. The component commanders plan and execute JTMD operations under the guidance and in support of the objectives of the JFC. The JFC uses the joint force staff to plan, monitor, advise, and coordinate the overall operation.*[18]

The concept above applies directly to moving targets. It provides for the all-important commander's guidance to be incorporated into all operations and clearly states the duties required of the J-1, J-2, J-3 and so on. Also, component commanders are given direct guidance on responsibility for planning and conducting operations within their AO.[19] To summarize, this chapter addresses the who and what for the JFC. By taking the narrow focus of JTMD and making more general references to moving targets, the entire chapter would support my thesis. Now it is time to look at the where, when and how of prosecuting moving targets.

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[16] Joint Chiefs of Staff, Doctrine for Joint Theater Missile Defense (Joint Pub 3-01.5) (Washington, D.C.: 22 February 1996), I-7.
[17] Gordon M. Wells, "Deep Operations, Command Control, and Joint Doctrine: Time for a Change?," Joint Force Quarterly 14 (Winter 1996-1997): 102.
[18] Joint Chiefs of Staff, Joint Pub 3-01.5, ix.
[19] Ibid., II-7.

Planning and Operations:

Planning and operations are the crux of JTMD doctrine. Chapter III of Joint Pub 3-01.5 should lay out the basis for locating and engaging the needle in the haystack as I have built the case so far. If my thesis holds true, then chapter III will have substantial support for moving target doctrine. Moving target operations will also require the simultaneous and sequential execution of taskings theater-wide. The opening lines of the chapter set the stage succinctly.

> *Successful JTMD operations are highly dependent on the simultaneous and sequential execution of a wide spectrum of tasks and activities, some of which occur or begin prior to the initiation of the use of force. Significant among these are intelligence preparation of the battlespace (IPB); JTMD preparation and training; and operation planning. Additionally, logistic and geographic considerations will impact many aspects of early JTMD planning.*[20]

Each of the 3 primary taskings (IPB, preparation and training, and planning) will be discussed separately to ensure supporting points are captured.

As in any threat scenario, the first step is going to be knowing all that can be known about the types of moving targets and the theater of operations: in other words, IPB must put the moving target threat in the context of the theater of operations. The analysis should reduce the vagaries of the threat and lay out positive enemy courses of action. It should encompass capabilities, and more importantly, vulnerabilities.[21] Preparation and training is a must for countering moving targets. Given the dynamic

[20] Ibid., III-1.

reality of putting plans into action and the tendency for change, moving target doctrine must be prepared and exercised to make all players familiar with the new concept of operations. By substituting moving target for theater missile (TM), the following excerpt applies:

> *Well-rehearsed TM defense plans and preparations allow forces in a developed theater to react swiftly across the range of military operations. TM defense systems should provide timely C4I and target acquisition before hostilities commence.*[22]

Finally, all the background work must be incorporated into a coherent operational plan to attack moving targets. Forces must be organized and targets prioritized to maximize results. Rules of Engagement must be enacted that will protect forces and permit rapid engagement.[23]

With preparatory actions done, offensive operations can begin. Attack operations in JTMD Doctrine are the critical actions for moving targets. The same types of action taken to detect, identify, allocate, and engage TM targets apply directly to moving targets. The only change for engaging moving targets is one of context; operators need to apply this doctrine in a general manner instead of against a specific threat. Instead of attacking only one specific moving target threat, as has been suggested TMs are, the doctrine is used as the basis for attacking a more general class of threats. Doctrine should not be tactical in nature,

[21] Ibid.
[22] Ibid.
[23] Ibid., III-2.

but distilled truths. These truths must have proven themselves constant throughout conflicts and offer the best methods for employing Blue combat power. The following two passages illustrate this concept:

> *Attack operations can be preemptive or reactive as part of counterair, strategic attack, interdiction, fire support, maneuver, ASW, antisurface warfare, strike warfare, amphibious operations, or special operations. A sustained effort is required to reduce the enemy's TM capability and involves the execution of mutually supporting tasks. The detection, acquisition, identification, tracking, and attack tasks are highly dependent on a near-real-time C4I process and rapid targeting capability. Attack operations are challenging because TM systems are generally hard to detect since they will normally be dispersed, mobile, electronically quiet, and redundant. Attack operations use all-source intelligence to locate and attack enemy TM systems, their components, and supporting nodes.*[24]

> *When ground forces have been deployed and if a JFACC has been designated, the JFC will normally task the JFACC as the supported commander to plan for and conduct, as apportioned, attack operations against longer range TMs outside the other component commanders' AOs. The JFACC should also plan for and maintain visibility on the theater/JOA-wide attack operations effort. The JFC will normally task component commanders for conduct of attack operations against TMs within their assigned AOs.*[25]

With the necessary moving target/TM transposition, the passages speak directly to a succinct concept of attack operations and C2 for forces. When applying lethal force so quickly, extensive pre-engagement coordination is necessary to engage these time-critical targets. Though not an exclusive joint force air component commander (JFACC) show, JTMD correctly points out the ACC maintains situational awareness on the entire theater and controls assets capable of deep strike. As each component fields deep strike weapons, the synchronization of these weapons is a necessity to prevent fratricide.[26]

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[24] Ibid., III-11.
[25] Ibid.
[26] Vozzo, "Coordinate Fires," 43.

As for the planning of such operations, the following quote sums up the process completely.

> *Because of the mobility of TM systems, the time to acquire, target, and attack key elements may be very short. Thus, an accelerated execution cycle using the decide-detect-deliver process is required. The decision to attack TMs may have already been made based on the JFC's priorities and facilitated by the ROE. Accurate targeting data is required for execution. Such decisions provide focus and priorities for intelligence collection management and the attack planning process. ROE approval criteria for attack or a "trigger event" established during the planning process will initiate the attack operation. For aircraft, this decision could well be made by the aircrew orbiting over or near the target area in anticipation of TM activities. When implemented, this provides for quick, efficient, and effective use of limited C4I and attack means.*[27]

Again, the time critical nature of the target and its inherent mobility is addressed. Also, compressed sensor-to-shooter schemes are employed to engage targets as fast as possible. This is a key factor for addressing moving targets (reference the Framework section of this paper).

Sensors are critical for IPB; the detection of a moving targets is the catalyst for operations to begin. Chapter 3 covers the importance of sensors on attack operations. Moreover, it covers many of the comments already made concerning IPB and the compression of the Sensor to Shooter chain. The doctrine addresses the reliance on sensors, near-real-time capability, communications, and weapons with sufficient deep strike capability. Command and control and operational guidance is expressly addressed.[28] These concepts sum up the entire moving target operational scheme and are solid support for my thesis.

[27] Joint Chiefs of Staff, Joint Pub 3-01.5, III-12.
[28] Ibid., III-13.

Non-supporting passages from Joint Pub 3-01.5 were few. JTMD presents significant detail on active and passive defense against the TM threat. If TMs are not destroyed on-carriage, the doctrine pursues in-flight targeting of the missile. This does not apply to the general moving target set. Working at small levels of detail limits JTMD doctrine applicability to moving targets though this is critical for missile defense. The non-supporting portions of JTMD doctrine are narrowly focused on the TM target set and do not have the breadth of coverage of the cited passages.

With the evidence massed, from the specific to the general in this case, I feel JTMD doctrine is applicable in large part to the more general class of moving targets.

RECOMMENDATION

There was a catalyst for the creation of Joint Theater Missile Defense Doctrine and I believe it is still viable work. However, the new threat of moving targets and the joint force interest in the issue forces the DoD to look in new directions. My recommendation is to create a new doctrinal publication for moving targets using significant portions of JTMD doctrine as a basis. This allows moving target doctrine to provide a more general application of the concepts discussed. The new publication should be numbered 3-01.5, Doctrine for Moving Targets. *Doctrine for Joint*

Theater Missile Defense should be renumbered 3-01.51 to show its placement under the overarching doctrine of moving targets. This solution would address implied capabilities doctrinally so CINCs/JFCs can incorporate them into future deliberate and crisis action planning.

CONCLUSION

JTMD doctrine is viable and necessary for future military operations. However, information technology is providing commanders with leverage over moving targets; U.S. technological advances are proving to be enablers for new capabilities. Joint Pub 3-01.5, *Doctrine for Joint Theater Missile Defense* provides an excellent baseline from which to move from a specific application of moving target to a more general doctrinal publication. This allows the combatant commands to plan, train, and execute along accepted doctrinal lines for moving targets where delaying only hours can be the difference between success and failure.

GLOSSARY

AADC	area air defense commander
ACC	air component commander
AO	area of operation
ASW	antisubmarine warfare
C2	command and control
C4	command, control, communications, and computers
C4I	command, control, communications, computers, and intelligence
CINC	combatant commander; commander in chief
EW	electronic warfare
FEBA	forward edge of the battle area
HN	host nation
IEW	intelligence and electronic warfare
IPB	intelligence preparation of the battlespace
J-2	joint intelligence staff
J-3	joint operations staff
J-4	joint logistics staff
J-5	joint planning staff
J-6	joint C4I systems staff
JFACC	joint force air component commander
JFC	joint force commander
JOA	joint operations area
JTCB	Joint Targeting Coordination Board
JTMD	joint theater missile defense
NBC	nuclear, biological, and chemical
OPSEC	operations security
RSTA	reconnaissance, surveillance, and target acquisition
ROE	rules of engagement
SOF	special operations forces
TM	theater missile

TMD	theater missile defense
TPFDL	time-phased force deployment list
US	United States
WMD	weapons of mass destruction

DEFINITION OF TERMS

air tasking order--(DOD) A method used to task and disseminate to components, subordinate units, and command and control agencies projected sorties/capabilities/forces to targets and specific missions. Normally provides specific instructions to include call signs, targets, controlling agencies, etc., as well as general instructions. Also called ATO.[29]

asymmetric attack-- Attacks where an enemy uses his strength against an opponent's weakness. The opposite of force on force.

command and control--(DOD) The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. Also called C2.[30]

doctrine--(DOD) Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application. See also combined doctrine; joint doctrine; multi-Service doctrine.[31]

Factor force-- The instruments of national power that impact operations. Can be air, naval or ground forces, active or reserve. Can also imply political, economic and military power.

Factor space-- The spatial characteristics on an area of operations that impact operations. Examples include topography, demography, infrastructure, culture, ideology and transportation systems.

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[29] Joint Chiefs of Staff, Approved Terminology (Joint Pub 1-02) (Washington, D.C.: 23 March 1994), 31.
[30] Ibid., 110.
[31] Ibid., 174.

Factor time-- The concept whereby attempts are made to quantify the impacts of time on operations for all sides in a conflict. Time-space and time-force factors must be addressed due to the interaction involved.

information--(DOD) 1. Facts, data, or instructions in any medium or form. 2. The meaning that a human assigns to data by means of the known conventions used in their representation.[32]

information superiority--(DOD) That degree of dominance in the information domain which permits the conduct of operations without effective opposition. See also information.[33]

information system--(DOD) The organized collection, processing, transmission, and dissemination of information, in accordance with defined procedures, whether automated or manual. In information warfare, this includes the entire infrastructure, organization, and components that collect, process, store, transmit, display, disseminate, and act on information.[34]

intelligence preparation of the battlespace--(DOD) An analytical methodology employed to reduce uncertainties concerning the enemy, environment, and terrain for all types of operations. Intelligence preparation of the battlespace builds an extensive data base for each potential area in which a unit may be required to operate. The data base is then analyzed in detail to determine the impact of the enemy, environment, and terrain on operations and presents it in graphic form. Intelligence preparation of the battlespace is a continuing process. Also called IPB.[35]

joint doctrine--(DOD) Fundamental principles that guide the employment of forces of two or more Services in coordinated action toward a common objective. It will be promulgated by the Chairman of the Joint Chiefs of Staff, in coordination with the combatant commands, Services, and Joint Staff. See also Chairman of the Joint Chiefs of Staff Instruction; combined doctrine; doctrine; guidance; joint publication; joint tactics,

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[32] Ibid., 261.
[33] Ibid., 262.
[34] Ibid.
[35] Ibid., 270.

techniques, and procedures; joint test publication; multi-Service doctrine.[36]

joint theater missile defense--(DOD) The integration of joint force capabilities to destroy enemy theater missiles in flight or prior to launch or to otherwise disrupt the enemy's theater missile operations through an appropriate mix of mutually supportive passive missile defense; active missile defense: attack operations; and supporting command, control, communications, computers, and intelligence measures. Enemy theater missiles are those that are aimed at targets outside the continental United States. Also called JTMD.[37]

moving target-- A target characterized by substantial mobility. Due to the transient nature of target location, they are very difficult to engage.

Network centric-- An emerging technology whereby information superiority allows sensor-to-shooter timespans to be compressed. Information is available on a near real time basis for all combatants to use.

Sensor to shooter-- Term defining the timespan required for intelligence assets to analyze sensor data and provide accurate targeting data to the shooter. Emerging technology making it possible to shorten this timespan. Also called STS.

sensor--(DOD, NATO) An equipment which detects, and may indicate, and/or record objects and activities by means of energy or particles emitted, reflected, or modified by objects.[38]

target of opportunity--(DOD) 1. A target visible to a surface or air sensor or observer, which is within range of available weapons and against which fire has not been scheduled or requested. 2. nuclear--A nuclear target observed or detected after an operation begins that has not been previously considered, analyzed or planned for a nuclear strike. Generally fleeting in nature, it should be attacked as soon as possible within the time limitations imposed for coordination and warning of friendly troops and aircraft.[39]

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[36] Ibid., 285.
[37] Ibid., 296
[38] Ibid., 477.
[39] Ibid., 531.

theater missile--(DOD) A missile, which may be a ballistic missile, a cruise missile, or an air-to-surface missile (not including short-range, non-nuclear, direct fire missiles, bombs, or rockets such as Maverick or wire-guided missiles), whose target is within a given theater of operation.[40]

time-sensitive targets--(DOD) Those targets requiring immediate response because they pose (or will soon pose) a clear and present danger to friendly forces or are highly lucrative, fleeting targets of opportunity.[41]

[40] Ibid., 539.
[41] Ibid., 545.

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